

Ship Wed Sept. 10 - LATEST - AOG!

Work Order ID 105505

105505

Page 1

August-07-13 2:26:19 PM

Item ID: D412-596-203

Accept

N900040100

Setup Start

NS1

Revision ID: PRELIM

Item Name: 39" Aft Crosstube

Stop *NS2*

Start Date: 8/07/13

Start Qty: 100

1

Cust Item ID:

Required Date: 8/16/13

Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|---|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| Draw Nbr | Revision Nbr | | | | | | | | |
| D412-596-203 | PAT Rev B Simulation | | | | | | | | |
| 100 | DOCUMENT CONTROL | 0.00 | | | | | | | |
| *100* | | | | | | | | | |
| DC | Memo | 0.00 | | | | | | | |
| Document Control | Photocopy bluefile & type labels per PPPD412-596-203 | | | | | | | | |
| | CHG001 | | | | | | | | |
| 110 | BENDING MACHINE - CROSSTUBES | 0.00 | | | | | | | |
| *110* | | | | | | | | | |
| CNC Bend 2 | Memo | 0.00 | | | | | | | |
| CNC Alpha 160 Bender | Bend tube as per Dwg D412-596-203 using CNC bender program _____ and Folio FT _____ | | | | | | | | |
| | ****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS**** | | | | | | | | |
| 127 | QC15- Crosstube Dimensional Check | 0.00 | | | | | | | |
| *127* | | | | | | | | | |
| QC | Memo | 0.00 | | | | | | | |
| Quality Control | ***MARK CUT LINES*** | | | | | | | | |

PRELIMINARY ISSUE

DAS
08
9-09

TW 14-04-03

(1) 14/9/4 DAS 12 9-09

Work Order ID 105505

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August-07-13 2:26:19 PM

Item ID: D412-596-203

Accept

N900040100

Setup Start *NS1*

Revision ID: PRELIM

Stop *NS2*

Item Name: 39" Aft Crosstube

Start Date: 8/07/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 8/16/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

128

0.00

128

Crosstubes

Crosstubes

★
SEE
ATTACHED

Memo

CUT TUBE AT HEIGHT ON FAI SHEET

VERF HEIGHT 36.25 BY QC 15 LEVEL INSPECTOR

VERF TWIST 0.75 BY QC15 LEVEL INSPECTOR

DAS

12

9-89

DAS

12

9-89

14/9/4

14/9/4

JB 14-04-08 30

130

0.00

130

Crosstubes

Crosstubes

N/A
JB 14/9/4

Crosstubes

Memo

1- Drill tube as per Dwg D412-596-203 Using DT _____ Drill Jigs,
Set-up drill table as per QSI 010

2- Deburr

3- Engrave Part # and Batch # as per Dwg D412-596-203

4- Remove all marks from tube within limits of D412-596-203 DWG.

5- Apply a light coat of LPS3 on the interior of tube

Batch: _____

JB 14-05-06

Work Order ID 105505

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Item ID: D412-596-203

Accept

N900040100

Setup Start

NS1

Revision ID: PRELIM

Stop

NS2

Item Name: 39" Aft Crosstube

Start Date: 8/07/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 8/16/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

NR1

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

140

QC6- Inspect dimensions to drawing

0.00

140

QC

Memo

Quality Control

~~160 - send for HT~~

172

0.00

172

Crosstubes

Memo

Crosstubes

LOAD TEST TO 3000LB FOR 1 MINUTE

174

Outsource process - NDT per QSI038 4.1

0.00

174

Outsource2

Memo

Outsource process - NDT

ISSUE P/O TO ACCUREN: 25651

N/A P14/4/22

CX14/109/05①

Work Order ID 105505

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Item ID: D412-596-203 Accept *N900040100* Setup Start *NS1*
 Revision ID: PRELIM Stop *NS2*
 Item Name: 39" Aft Crosstube
 Start Date: 8/07/13 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 8/16/13 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| | | | | | | | | | |
|-----------|--|------|--|--|--|--|--|--|--|
| 176 | Receive & Inspect for Damage & Mat'l Certs | 0.00 | | | | | | | |
| *176* | | | | | | | | | |
| Packaging | Memo | 0.00 | | | | | | | |
| Packaging | | | | | | | | | |

| | | | | | | | | | |
|-----------------|---|------|--|--|--|--|--|--|--|
| 178 | QC5- Inspect part completeness to step on W/O | 0.00 | | | | | | | |
| *178* | | | | | | | | | |
| QC | Memo | 0.00 | | | | | | | |
| Quality Control | | | | | | | | | |

| | | | | | | | | | |
|----------------|------------|------|--|--|--|--|--|--|--|
| 180 | SprayPaint | 0.00 | | | | | | | |
| *180* | | | | | | | | | |
| SprayPaint | Memo | 0.00 | | | | | | | |
| Spray Painting | | | | | | | | | |

1-Prime inside & outside crosstube as per QSI 005 4.2
 BATCH: 130128 T: 100-130
 2-Paint Outside of Tube as per Dart QSI 005 4.2
 BATCH: 129977 T: 630-700
 2- Clear 129174
 3- Mask

14/9/15 (1)
 14-9-9
 DAS 38 9-89
 14-9-9
 DAS 41 9-89
 14-9-9

105505

August-07-13 2:26:19 PM

N900040100

Setup Start *NS1*

Stop *NS2*

Start Date: 8/07/13 **Start Qty:** 1.00

*** 1 ***

Required Date: 8/16/13 **Req'd Qty:** 1.00

*** 1 ***

Customer:

Reference:

Run Start *NR1*

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Operation Description

Set Up/ Run Hours

| Tool ID | Tool # | Plan Code |
|---------|--------|-----------|
|---------|--------|-----------|

**Accept
Qty**

Reject Qty

**Reject
Number****Insp.
Stamp**

190

QC14- Inspect Spray Paint

0.00

190

QC

Memo

0.00

Quality Control

DAS
 38
 9-89 14-9-10

Work Order ID 105505

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August-07-13 2:26:19 PM

Item ID: D412-596-203
Revision ID: PRELIM
Item Name: 39" Aft Crosstube

Accept

N900040100

Setup Start *NS1*
Stop *NS2*

Start Date: 8/07/13 Start Qty: 1.00 *1*
Required Date: 8/16/13 Req'd Qty: 1.00 *1*

Cust Item ID:
Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start *NR1*
Stop *NR2*

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|---|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 200 | | 0.00 | | | | | | | DAS |
| *200* | Crosstubes | | | | | 1 | | | 41 |
| Crosstubes | | | | | | | | | 9-89 |
| Crosstubes | Memo | 0.00 | | | | | | | 14-8-8 |
| | 1- Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 12. | | | | | | | | |
| | A/R scoth-weld DP460 BATCH #: 128480 exp 3/15 | | | | | | | | |
| | 2- Install clamp with rubber cushion as per DWG. note 13 | | | | | | | | |
| | 3- Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe | | | | | | | | |
| | 4- Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. | | | | | | | | |
| | A/R Proseal 890 Batch: 128638 exp 10/14 | | | | | | | | |
| | 5- Install supports clamps using DT na as per Dwg D412-596-203, Torque clamps on support to 80-100 IN-LBS. Torque clamps on chafing shield to 40-50 IN-LBS. | | | | | | | | |

☆

SEE

Attached

★
SEE
Attached

Work Order ID 105505

105505

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August-07-13 2:26:19 PM

Item ID: D412-596-203 Accept *N900040100* Setup Start *NS1*
 Revision ID: PRELIM Stop *NS2*
 Item Name: 39" Aft Crosstube
 Start Date: 8/07/13 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 8/16/13 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|---|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 240 | Packaging | 0.00 | | | | | | | |
| *240* | | | | | | | | | |
| Packaging | Memo | 0.00 | | | | | | | |
| Packaging | Identify and pack for shipping as per PPPD412-596-203 | | | | | | | | |
| | Location: _____ | | | | | | | | |
| | PPP Rev: _____ | | | | | | | | |
| 250 | QC21- Final Inspection - Work Order Release | 0.00 | | | | | | | |
| *250* | | | | | | | | | |
| QC | Memo | 0.00 | | | | | | | |
| Quality Control | | | | | | | | | |

DAS
06
3-08

SEP 10 2014

MLJ 1409-10
MLJ 1409-10

POSITIVE RECALL

EFFECTIVE 130807 AUTH LN

RELEASED LN DATE 11/19/13

BRUB
Dy. only
S. del alco

release
see 2/2/2014
email

Picklist Print

August-07-13 2:26:18 PM

Page 1

Work Order ID: 105505
Parent Item: D412-596-203
Parent Item Name: 39" Aft Crosstube

Start Date: 8/07/13

Required Date: 8/16/13

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A NEW ISSUE JFS 13/03/22 VERIFY BY:DD

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|--|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| D412-596-203TRN Crosstube Aft Extended Turning Detail | | Manufactured | No | | | 110 | Each | 0.0000 | ① | 1 | | JW 14-04-03 | |

B 115354

D3895-063 530 x 2

B 117571

②

DAS
41 14-9-8
9-89

D4910-1 x 2

B 119877

2

DAS
41 14-9-8
9-89

D4909-1 x 1

B 120359

1

DAS
41 14-9-8
9-89

M821970-26 x 4

B 107545

4

DAS
41 14-9-8
9-89

M521970-28 x 2

B 129279

2

DAS
41 14-9-8
9-89

| Item | Qty -203 | Part Number | Description |
|------|-------------|-------------------|------------------------------------|
| 1 | X | D412-596-203 | CROSSTUBE ASSEMBLY (412 HI HI AFT) |
| 2 | 1 | D6020-170 | CROSSTUBE MATERIAL |
| 3 | 2 | D3595-063-530 | RUBBER CUSHION |
| 4 | 1 | D4909-1 | SUPPORT |
| 5 | 2 | D4910-1 | CHAFING SHIELD |
| 7 | 4 | MS21920-26 | CLAMP |
| 8 | 2 | MS21920-28 | CLAMP |
| 9 | A/R | SCOTCH-WELD DP460 | EPOXY ADHESIVE, 3M SCOTCH-WELD |
| 10 | A/R | PROSEAL 890 | SEALANT |

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-170
FINISHED LENGTH = 151.38±0.090 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN B8-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-596-203" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 191.1 lb RAW MATERIAL, 118.3 lb AFTER MACHINING
118.0 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

| | | | |
|------------|---------------------------------------|----|----------|
| B | ADD INSPECTION WINDOW (ZN C8-1, B8-2) | CP | 13.08.16 |
| A | NEW ISSUE | CP | 13.03.13 |
| REV. | DESCRIPTION | BY | DATE |
| DESIGN | | | |
| DRAWN | | | |
| CHECKED | | | |
| MFG. APPR. | | | |
| APPROVED | | | |
| DE APPR. | | | |
| DATE | 13.06.16 | | |

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

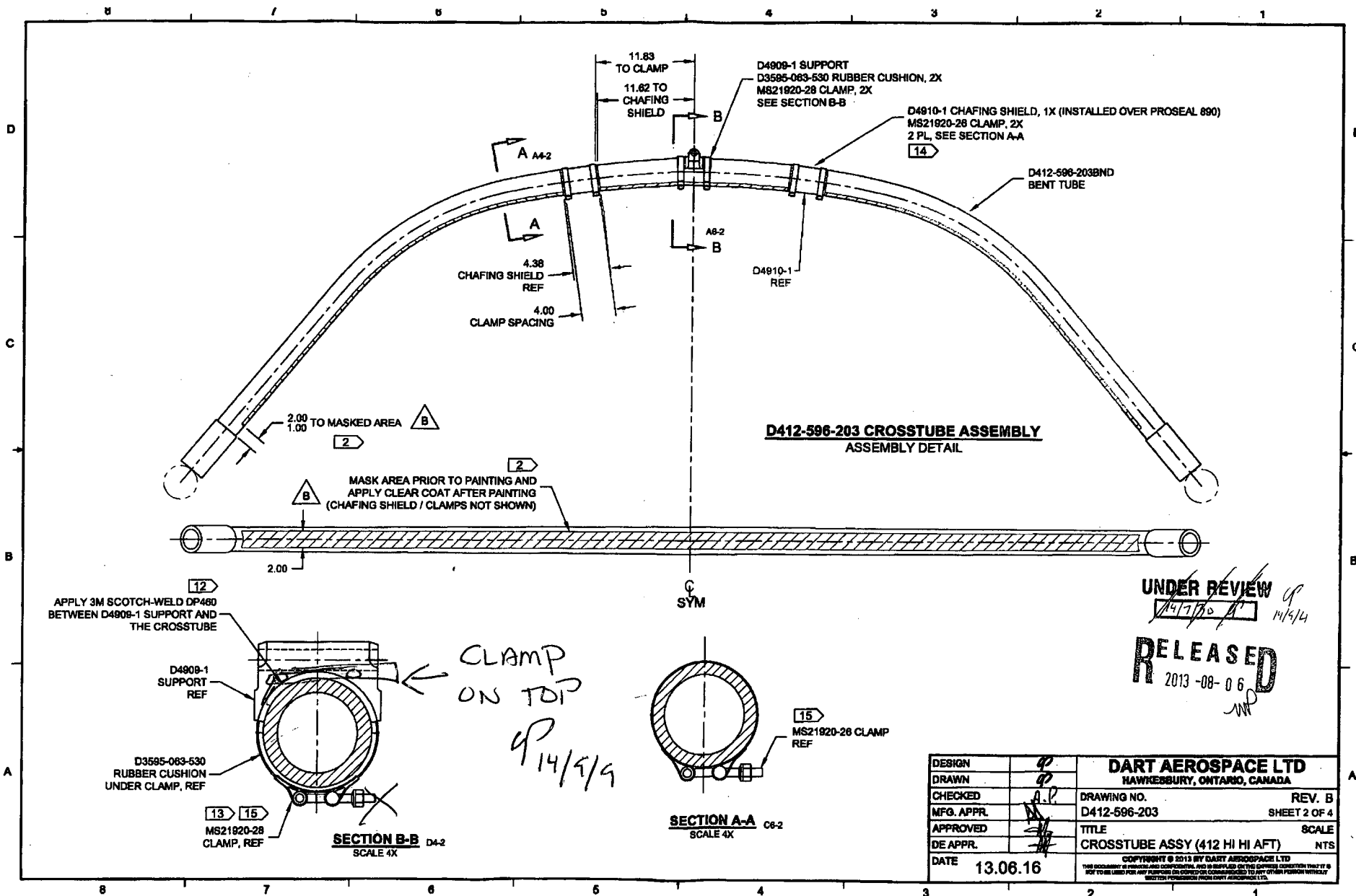
DRAWING NO. D412-596-203
REV. B
SHEET 1 OF 4

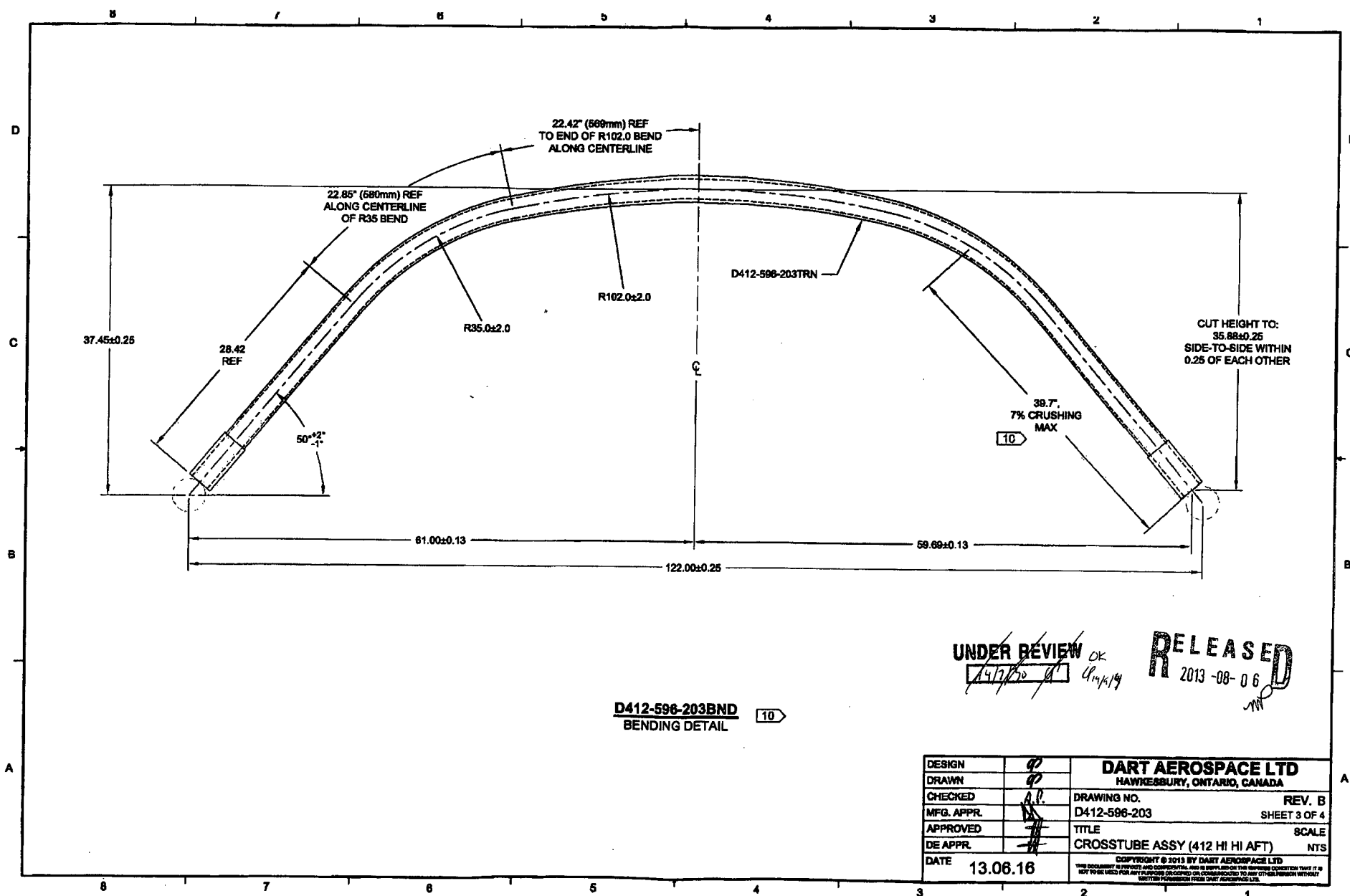
TITLE
CROSSTUBE ASSY (412 HI HI AFT)
SCALE
NTS

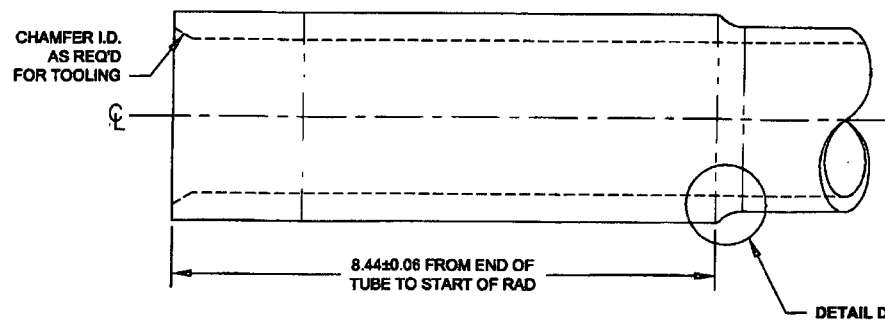
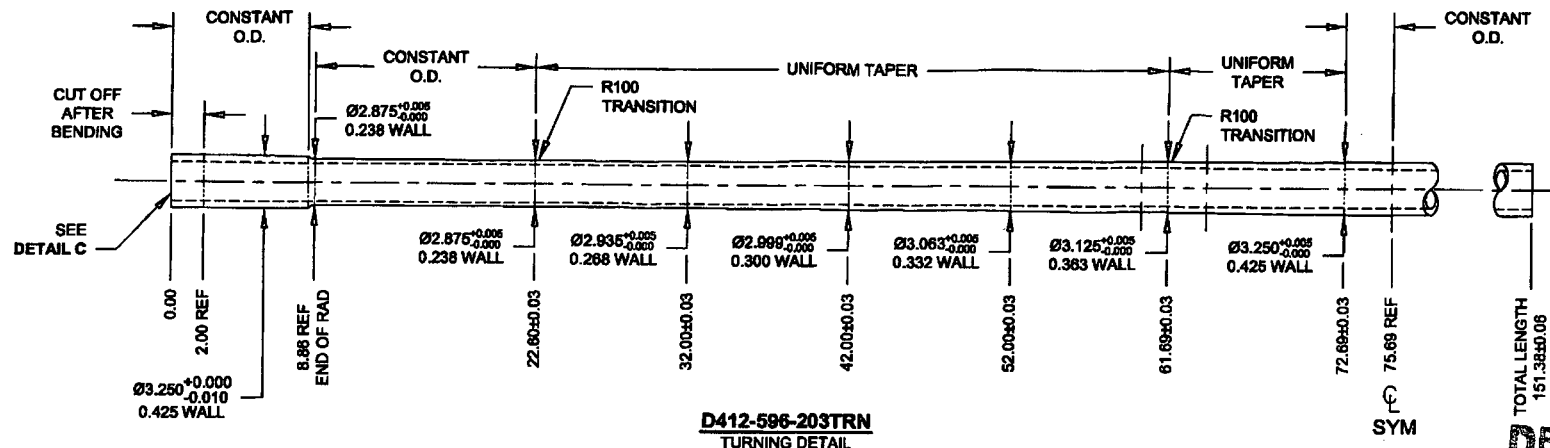
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UNDER REVIEW OK
17/36 9/7
URF 14-601 9/15/4

RELEASED
2013-08-06
MP

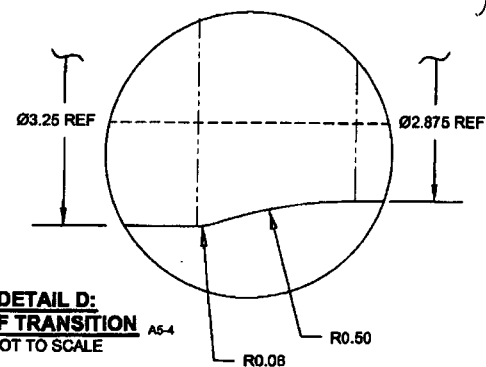






DETAIL C:
CUFF TRANSITION C8-4
SCALE 4X

DETAIL D:
CUFF TRANSITION A5-4
NOT TO SCALE



| | | | |
|--|----------|--|--------------|
| DESIGN | DP | DART AEROSPACE LTD | |
| DRAWN | DP | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | DP | DRAWING NO. | REV. B |
| MFG. APPR. | DP | D412-596-203 | SHEET 4 OF 4 |
| APPROVED | DP | TITLE | SCALE |
| DE APPR. | DP | CROSSTUBE ASSY (412 HI HI AFT) | NTS |
| DATE | 13.06.16 | COPYRIGHT © 2013 BY DART AEROSPACE LTD | |
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OK 14/6/14
UNDER REVIEW

RELEASED
2013-08-06

D412-596-203

Stainless Steel Unhardened

Setup

Rollers: 3.25x3 **Without spacers**

Tangent lines: Center line
24" from center line, black
21" from center line, red

Buggy shims: 1.85" on buggy "A" on cuff

1:1 actual size drawing will be kept aside for use on further tubes.

Middle Bend

Tube begins on large table, at 24" black line, at an approach of **2740 on both rollers.**

2740/2740

Run programs 1,2,3, check (due to this being a prelim. tube.) Then run 4 and 5 to finish. Middle should be finished at 5. Compare middle to reference drawing, which will be placed on drill table until drawing is included on measuring board.

Side bends

Start bending from 21" red line going down taper at an approach of **3010 on both rollers.** run 1,2,3,4,5,6 check. from there on run 7-12 as needed at an approach of **3210 on both rollers** checking between each program. Programs back out automatically after each pass. On the second side, the buggy must be placed further up the taper, as it will hit the table if it is left on the cuff.

notes

13/04/03 bent preliminary tube today, side 1 was perfect, side 2 bent in too much at prog 11 by almost .400" this caused us to write program 10b to prevent over bendin in the future. side 1 had a more progressive bend due to the development, this may have caused the difference in the two widths.

13/04/26

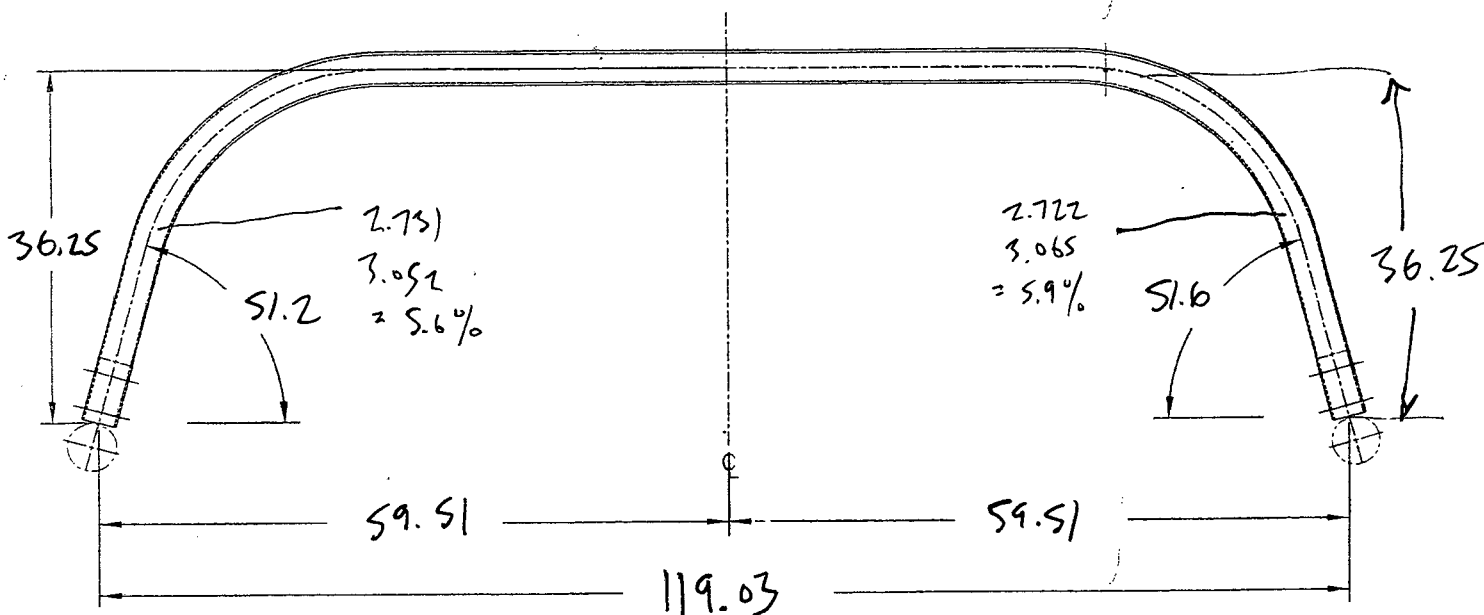
bent second prelim tube, this time hardened. the tube reacted well to the same programs, although needed additional programs in both middle and side bends to put the tube in tolerance. tube bent more quickly on the side with the heat treating holes, and finished earlier in programs.

heat treating hole side: span 59.65 finished at prog 16b
opposite side: span 59.65 finished at prog 19

| | | | | | | |
|----|----|----|--------|----|----|----|
| 22 | 12 | 1 | Middle | 1 | 12 | 24 |
| 23 | 13 | 2 | 1 | 2 | 13 | 25 |
| 24 | 14 | 3 | 2 | 3 | 14 | 26 |
| 25 | 15 | 4 | 3 | 4 | 15 | 27 |
| 26 | 16 | 5 | 4 | 5 | 16 | 28 |
| | 17 | 6 | 5 | 6 | 17 | |
| | 18 | 7 | 6 | 7 | 18 | |
| | 19 | 8 | 7 | 8 | 19 | |
| | 20 | 9 | 8 | 9 | 20 | |
| | 21 | 10 | 9 | 10 | 21 | |
| | 22 | 11 | 10 | 11 | 22 | |
| | 23 | | 11 | | 23 | |

| | | | |
|------------------------|------|--------------|---|
| DART AEROSPACE LTD | | Work Order: | |
| Description: Crosstube | | Part Number: | D |
| Inspection Dwg: D | Rev: | Page 1 of 1 | |

| Required Dimension | Min | Max |
|--------------------|--------|--------|
| Height | 35.63 | 36.13 |
| 1/2 Span | 59.56 | 59.82 |
| Angle | 49 | 52 |
| Total Span | 119.13 | 119.63 |



| Comments |
|--------------------------|
| CRUSHING $5.6\% / 5.9\%$ |
| Twist = $0.750''$ |

| | |
|-----------------|------------------|
| QC15 Inspection | DAS 12 200 |
| Date | 14/4/4 |

| Rev | Date | Change | Revised by | Approved |
|-----|------|-----------|------------|----------|
| | | New Issue | | |

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: Jul Date: 14/9/18QA Closed: Jul Date: 14-9-16

| | | | | | | | | | | | |
|--|----------------|------------|---|--|--|--|-----------------------------------|-----------------------------|---|--|--|
| Work Order: <u>105508</u> Part No. <u>0412-596-203</u> NCR No. <u>14-4247</u> | | | | DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input checked="" type="checkbox"/> Work Order Update <input type="checkbox"/> | | AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input checked="" type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div> | | | | | |
| Root Cause | Date | Step | Qty | Description of work order update or Non-conformance | Initial Chief Eng | Action Description | Sign & Date | Verification | QC Inspector | | |
| Doc/Data <input type="checkbox"/> Equip/Tooling <input type="checkbox"/> Operator <input type="checkbox"/> Material <input type="checkbox"/> Setup <input type="checkbox"/> Other <input type="checkbox"/> Process <input type="checkbox"/> Supplier <input type="checkbox"/> Training <input type="checkbox"/> Unapproved <input type="checkbox"/> | <u>14/4/22</u> | <u>110</u> | <u>1</u> | <u>Tube is over bent.</u> | <u>DAS</u> <u>12</u> <u>9-89</u> <u>14/4/22</u> | <u>Cut at 36.25"</u> <u>high. width will</u> <u>be 59.4/59.4"</u> <u>OK for production part,</u> <u>Excess testing piece should</u> <u>be in tolerance.</u> | <u>Jul</u> <u>14-09-10</u> | <u>S</u> <u>14/09/10</u> | <u>S</u> <u>14/09/10</u> | | |
| FAULT CATEGORY 9 | | | | | | | | | | | |
| Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped. <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube | | | General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio | | | <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions | | | <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other | | |

Linda Lacelle

From: David Shepherd
Sent: September-04-14 12:27 PM
To: Linda Lacelle; Mike Petsche; Chris Provencal
Cc: Sian Willems; Jennifer Renwick
Subject: RE: extended height SS

Should be NDT'd but not drilled.

Regards,
David

From: Linda Lacelle
Sent: September-04-14 10:02 AM
To: Mike Petsche; Chris Provencal
Cc: David Shepherd; Sian Willems; Jennifer Renwick
Subject: RE: extended height SS

Yup, got the w/o on my desk..
Does this tube need to be:
NDT'd ? was not yet
Drilled? At one point we said we wouldn't drill the ext height
Has anything else changed?

L

From: Mike Petsche
Sent: September-04-14 11:57 AM
To: David Shepherd; Chris Provencal; Sian Willems; Linda Lacelle; Jennifer Renwick
Subject: FW: extended height SS

My ass is officially covered

This is the tube we are a-fixin' to send to wildcat

From: Chris Provencal
Sent: Tuesday, April 22, 2014 1:33 PM
To: Linda Lacelle; Nigel Forbes
Cc: Mike Petsche
Subject: RE: extended height SS

Linda,

Sorry, I had wanted to talk to David about it last week but got sidetracked and forgot.

The tube is too narrow and must be cut high to bring it closer to tolerance. If we cut it at 36.25" high (+0.37" from nom.) the tube will be 118.8" wide (-0.58" from nom.), which I consider OK for a production part.

But because this part is for fatigue testing, where the width/height of the part will have an effect on the result, I would rather keep this part for production (B105505) and make another tube for Exova testing. We don't have a large sample size for our testing, so I would rather keep the variables down to a minimum.

-Chris

From: Mike Petsche
Sent: Tuesday, April 22, 2014 12:59 PM
To: Chris Provencal
Subject: Fwd: extended height SS

Chris

How badly over bent is this tube?

Sent from my iPhone

Begin forwarded message:

From: Linda Lacelle <llacelle@dartaero.com>
Date: April 22, 2014 at 12:46:16 PM EDT
To: Nigel Forbes <nforbes@dartaero.com>, Mike Petsche <mpetsche@dartaero.com>
Subject: extended height SS

Linda Lacelle

From: Mike Petsche
Sent: September-04-14 11:22 AM
To: Pete Olep; Alain Madore; Bill Beckett; David Shepherd
Cc: Laith Qatami; Steve Ghaleb; Alain Madore; Ben Bobic; Chris Provencal; Carrie Pearson; Chantal Chartrand; Diana Hagen; Holly Menard; Jackson Lin; Jean Kerr; Linda Pilon; Lucie Lamoureux; Linda Lacelle; Nancy MacLeod; Peggy McDonald; Shirley Hay; Patrick Smith; Sian Willems; Nigel Forbes; Kim Johnston
Subject: FW: 412 Stainless Steel Crosstube Situation
Attachments: D412-664-403 SS Aft Crosstube Now TCCA/FAA/EASA approved

All,

I just got off the phone with Exova a little while ago. Our test crosstube successfully made it to 40,000 cycles on a decently slick surface.

So, we will immediately remove the "under Review" from the regular height AND extended height stainless steel crosstubes.

The hounds may officially be released.

From: David Shepherd
Sent: July-30-14 2:27 PM
To: Pete Olep; Alain Madore; Bill Beckett (bbeckett@dartaero.com)
Cc: Laith Qatami; Steve Ghaleb; Alison Markus; Ben Bobic; Carrie Pearson; Chantal Chartrand; Diana Hagen; Holly Menard; Jackson Lin; Jean Kerr; Linda Pilon; Lucie Lamoureux; Nancy MacLeod; Peggy McDonald; Shirley Hay; Patrick Smith; Sian Willems
Subject: RE: Weekly Engineering Meeting Update - 30 July 2014

All,

Would like to clarify the 412 stainless steel crosstube situation here. There are two issues:

- 1) During the manufacturing process, there was a crack detected during NDT testing on one of the D412-664-403 crosstubes. The purpose of the NDT testing is to detect cracking during the manufacturing process and prevent us from shipping a cracked crosstube to a customer. We do this with every crosstube we make. At this point, we believe that this is an anomaly and there is no risk to any of the 5 crosstubes that have been shipped. At the same time, we are doing some further investigation to see whether there was a flaw in the material that led to this crack so we can try to prevent this from happening during future manufacture.

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: AW Date: 14/9/18

QA Closed: AW Date: 14-9-16

| | | | | | |
|------------------------------|--|--|---|--|--------------------------------------|
| Work Order: <u>105505</u> | DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input checked="" type="checkbox"/> Work Order Update <input type="checkbox"/> | AGAINST DEPARTMENT/PROCESS | | | |
| Part No. <u>D412-596-203</u> | | Skid-tube <input type="checkbox"/> | Crosstube <input checked="" type="checkbox"/> | Water Jet <input type="checkbox"/> | Engineering <input type="checkbox"/> |
| NCR No. <u>14-4248</u> | | Machining <input type="checkbox"/> | Small Fab <input type="checkbox"/> | Prod. Eng. Coord. <input type="checkbox"/> | Quality <input type="checkbox"/> |
| | | Thermoforming <input type="checkbox"/> | Finishing <input type="checkbox"/> | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/> |
| | | Large Fab <input type="checkbox"/> | Composite <input type="checkbox"/> | Supplier <input type="checkbox"/> | |

| Root Cause | Date | Step | Qty | Description of work order update or Non-conformance | Initial Chief Eng | Action Description | Sign & Date | Verification | QC Inspector |
|---------------|--------|------|-----|--|--------------------------------|--|--------------------------------|-------------------|-------------------|
| Doc/Data | 14/9/4 | 110 | 1 | Span after banding is 0.1" under tolerance. Twist = 0.75". RC: Benoni / Pans | DAS 12 989 14/9/4 | Acceptable. Based on test tubes which were twisted. 0.55", should have no problem assembling. | DAS 12 989 14/9/4 | S 14/02/10 | S 14/02/10 |
| Equip/Tooling | | | | | | | | | |
| Operator | | | | | | | | | |
| Material | | | | | | | | | |
| Setup | | | | | | | | | |
| Other | | | | | | | | | |
| Process | | | | | | | | | |
| Supplier | | | | | | | | | |
| Training | | | | | | | | | |
| Unapproved | | | | | | | | | |

FAULT CATEGORY

| | | | | |
|--|---|---|--|---|
| Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped. <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube | General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio | <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions | <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge | <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other |
|--|---|---|--|---|



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 /

WO #: MWO20446

Customer: Cash Sale

Dept: NDT YUL

Reference: 256

Descr:

PN:

DART AEROSPACE

S/N:

Qty: 1

Make:

Model:

Reg:

A/C S/N:

TSN: 0

CSN: 0

TSO: 0

Task:

Sequence: 0

Work Required:

CARRY OUT NDT ON THE FOLLOWING ITEMS:

① ITEM ID D412-596-203 - 39" AFT CROSS TUBE - WORK ORDER ID 105505

② ITEM ID D4866-2 - STRUT - WORK ORDER ID 121501 QTY 2

Action Taken:

Date:

Initial/Stamp:

LIQUID PENETRANT INSPECTION CARRIED OUT
ON ITEMS LISTED ABOVE IAW ASTM E1417-M13

① WORK ORDER ID 105505 = NO CRACKS FOUND

5 SEP 14

DOT-APP
19
53-89

② WORK ORDER ID 121501 = NO CRACKS FOUND

5 SEP 14

DOT-APP
19
53-89

| Description | Location | P/N | Qty | Batch | S/N Off | S/N On |
|-------------|----------|----------------|-----|--------|----------|--------|
| BLACK LIGHT | - | S/N T-20990N | | | | |
| PENETRANT | - | ARDROX 970P25E | | BATCH# | 02312131 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:

Name:

GARY SMITH

ACA/SCA
Stamp

DOT-APP
19
53-89

Date:

05 SEP
2014

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA

Date:

14/9/18

QA Closed:

Date:

14/9/16

| | | | | | |
|-----------------------------|--|--|------------------------------------|--|---|
| Work Order: <u>105505</u> | DISPOSITION Rework <input checked="" type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/> | AGAINST DEPARTMENT/PROCESS | | | |
| Part No. <u>D412596-203</u> | | Skid-tube <input type="checkbox"/> | Crosstube <input type="checkbox"/> | Water Jet <input type="checkbox"/> | Engineering <input checked="" type="checkbox"/> |
| NCR No. <u>14-4249</u> | | Machining <input type="checkbox"/> | Small Fab <input type="checkbox"/> | Prod. Eng. Coord. <input type="checkbox"/> | Quality <input type="checkbox"/> |
| | | Thermoforming <input type="checkbox"/> | Finishing <input type="checkbox"/> | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/> |
| | | Large Fab <input type="checkbox"/> | Composite <input type="checkbox"/> | Supplier <input type="checkbox"/> | |

| Root Cause | Date | Step | Qty | Description of work order update or Non-conformance | Initial Chief Eng | Action Description | Sign & Date | Verification | QC Inspector |
|--|---------|------|-----|--|------------------------|--|------------------------|---------------|---------------|
| Doc/Data <input checked="" type="checkbox"/> | 14/9/16 | 200 | 1 | MS21920-2B CLAMPS SHOULD BE INSTALLED BY SD MECHANISM IS ON TOP OF TUBE. TO PREVENT CHAFING RE. Design Chgs. | DAS 12 9-89 14/9/16 | Acceptable per design change on similar tube: D412-664-243 R&F | DAS 12 9-89 14/9/16 | 5 14/09/16 | 5 14/09/16 |
| Equip/Tooling <input type="checkbox"/> | | | | | | | | | |
| Operator <input type="checkbox"/> | | | | | | | | | |
| Material <input type="checkbox"/> | | | | | | | | | |
| Setup <input type="checkbox"/> | | | | | | | | | |
| Other <input type="checkbox"/> | | | | | | | | | |
| Process <input type="checkbox"/> | | | | | | | | | |
| Supplier <input type="checkbox"/> | | | | | | | | | |
| Training <input type="checkbox"/> | | | | | | | | | |
| Unapproved <input type="checkbox"/> | | | | | | | | | |

FAULT CATEGORY

| | | | | |
|--|--|---|--|---|
| Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped. <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube | General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input checked="" type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio | <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions | <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge | <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other |
|--|--|---|--|---|